WHAT IS CLAIMED IS:

1. A pattern formation member adopted to a sectioning image observation apparatus which selectively irradiates a light from a light source to
5   a sample, scans said sample, and acquires a light from said sample as a sectioning image, wherein

said pattern formation member comprises an irradiation section and a cutoff section,

each of said irradiation section and said cutoff
10   section is in a straight pattern, and

these straight patterns are disposed alternatively.

2. The pattern formation member according to claim 1, wherein
15   said pattern formation member is a rotation disk such that said irradiation section is a translucent section to pass a light and said cutoff section is a shield section to shield a light,

said rotation disk is rotated on a light path,
20   each of patterns to scan said sample by the light passing through said rotation disk is formed in a straight pattern, and

these patterns are disposed alternatively.

3. The pattern formation member according to
25   claim 1, wherein

a width of the straight pattern of said shield section is larger than that of said translucent

section.

4. The pattern formation member according to claim 1, wherein

said pattern formation member is a digital micro mirror having a plurality of mirrors, whose directions are independently changeable, disposed in a two-dimensional form.

5. A pattern formation member, according to claim 3, wherein said rotation disk is divided into a plurality of areas and a pattern of each of said plurality of areas is different.

6. The pattern formation member according to claim 5, wherein

said plurality of areas are located on concentric circles and each of them has different straight patterns.

7. A sectioning image observation apparatus which scans a sample with a light by using a pattern formation member described in claim 1, and acquires a reflected light from said sample as a sectioning image through said pattern formation member.

8. The sectioning image observation apparatus according to claim 7, further comprising a moving mechanism to change projection position on said rotation disk to said sample.

9. A sectioning image observation apparatus which enters an excited light with a predetermined wavelength

through an excitation filter to a pattern formation
member described in claim 1, scans a sample with a
light by using said pattern formation member, and
acquires a fluorescence emitted from said sample as a
sectioning image through said pattern formation member
and a barrier filter selecting a wavelength of the
emitted fluorescence.

    10. A sectioning image observation apparatus
comprising:

    a light source;

    a rotation disk having a pattern in which a slit
translucent section which passes a light and a straight
shading section which shields a light, are alternately
and periodically arranged;

    means to lead a light from said light source to
said rotation disk;

    means to irradiate a light passing said rotation
disk to a sample and project a pattern of said rotation
disk to the sample;

    an optical lens which projects a light reflected
from said sample *through* said rotation disk; and

    means to rotate said rotation disk on an optical
path, scan the pattern of said rotation disk
projected on the said sample, and acquires an image
passing said rotation disk as an sectioning image
among sample images projected on said rotation disk,
wherein

when an angle of said rotation disk surface and a surface normal to an optical axis is θ, an aperture of said lens from said sample is NA, an expansion rate of a sample image projected on said rotation disk is M,

5 a diameter (called as a number of view) on said rotation disk in an area of the observed sample is R, an angle between a main light beam which passes at an outermost edge of a diameter on said rotation disk of the observed sample area and an optical axis is ϕ, and

10 a wavelength of the light is λ, at least one of the following conditions are satisfied:

$\theta > \phi + 2NA/M$, and

$$\theta < \frac{M^2\lambda}{NA^2R} .$$

15

11. The pattern formation member according to claim 2, wherein

a shield area is formed at a portion to which straight patterns of said translucent section and said

20 shield section of said rotation disk is parallel to a scanning direction according to a rotation of said rotation disk in an observation field.

12. The pattern formation member according to claim 5, wherein

25 said plurality of areas have a plurality of sector shaped areas divided in a circumferential direction of said rotation disk.

13. The pattern formation member according to

Fig. 8
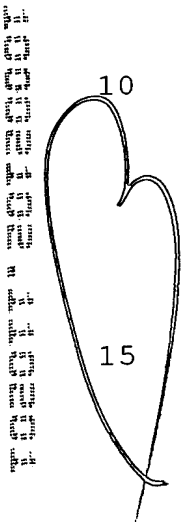
claim 5, wherein

said plurality of divided areas are different
direction areas of the straight patterns having
different direction of said translucent section and
5   said shield section not to be parallel to a scanning
direction according to a rotation of said rotation disk
in an observation field.

14.   The pattern formation member according to
claim 13, wherein
10   said different direction areas have a plurality of
sector shaped areas each having a predetermined central
angel, and
the straight pattern in said different direction
areas are another straight pattern area of said
15   translucent section and said shield section with sector
shape area.

15.   The pattern formation member according to
claim 13, wherein
each of said different direction areas has a
20   predetermined width, and
the straight patterns in each of said different
direction areas are straight patterns of said
translucent section and said shield section having
different direction from the straight pattern of the
25   other areas.

16.   The pattern formation member according to
claim 6, wherein at least two patterns of said

plurality of areas have patterns having different ratios of a width of said shield section and that of said translucent section.

17. The pattern formation member according to claim 16, wherein

a width of a straight portion of said translucent section is substantially constant.

18. The pattern formation member according to claim 17, further comprising
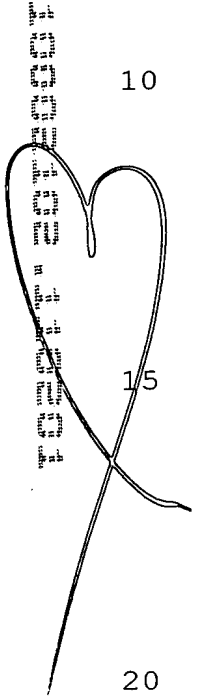
a plurality of areas having different direction of said translucent section and said shield section of the straight pattern of said rotation disk.

19. The pattern formation member according to claim 18, further comprising different direction areas on portions parallel to a scanning direction according to a rotation of said rotation disk in an observation field in the straight patterns, wherein

the straight patterns in each of said different direction areas are straight patterns of said translucent section and said shield section having different direction from the straight pattern of the other areas.

20. The pattern formation member according to claim 19, wherein

when a width of different direction area having a constant width is X and a period of said translucent section and said shield section is W in said rotation

disk, X/W is constant.

21. The pattern formation member according to claim 20, wherein

when said translucent section of said least two concentric circle areas have a same width and a period W of said translucent section and said shield section is different,

a period W of said translucent section and said shield section on an inner concentric circle area is smaller than that of an outer concentric circle area, and

a width X of a different direction area of inner and outer concentric circle areas is proportional to the period W.

22. The pattern formation member according to claim 6, wherein

at least two pattern of said plurality of areas have an equal ratio of a width of said translucent section and that of said shield section, and widths of said translucent section and said shield section are different for each of said areas.

23. The pattern formation member according to claim 22, further comprising different direction areas on portions parallel to a scanning direction according to a rotation of said rotation disk in an observation field in the straight patterns, wherein

the straight patterns in each of said different

direction areas are straight patterns of said

translucent section and said shield section having

different direction from the straight pattern of the

other areas.

5   24. The pattern formation member according to

claim 23, wherein

     when a width of different direction area having a

constant width is X and a period of said translucent

section and said shield section is W in said rotation

10   disk, X/W is constant.

     25. The pattern formation member according to

claim 24, wherein

     at least two areas in which said translucent

section and said shield section have same width are

15   located so that a period W of said translucent section

and said shield section on an inner concentric circle

area is smaller than that of an outer concentric circle

area, and

     a size of the width of different direction area in

20   the inner concentric circle areas is smaller than a

size of the width of different direction area in the

outer concentric circle areas.